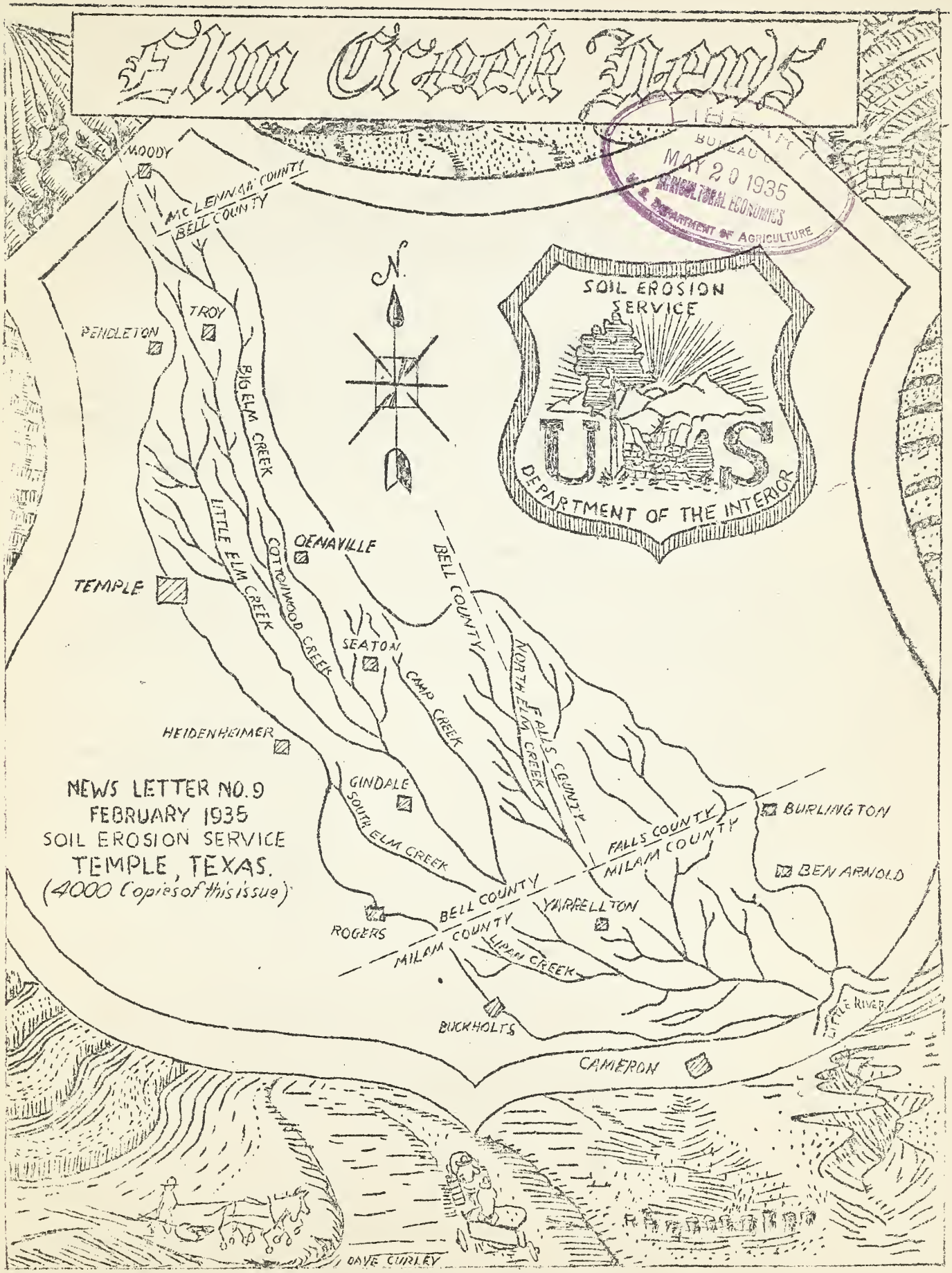
Elm Creek News



NEWS LETTER NO. 9
FEBRUARY 1935
SOIL EROSION SERVICE
TEMPLE, TEXAS.
(4000 Copies of this issue)

TO OUR COOPERATORS

Farmers who planted Austrian Winter Peas, Vetch or Hubam Clover from seed furnished by the Soil Erosion Service, please consult the Soil Erosion Service before plowing up these legumes. In cases where the freeze did sufficient damage to require replanting the Soil Erosion Service will furnish seed for replanting.

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We wish to urge all cooperators who have sodded terrace outlets or sodded ditches planned on their farms to prepare these vegetative outlets so they can be sodded. As soon as the outlets or ditches are prepared, notify the Soil Erosion Service. Any questions about vegetative outlets will be gladly answered and explained by the Soil Erosion Service.

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Several pasture sodding crews are now at work in the central portion of the watershed. This work is progressing very rapidly, as we plan to have all pastures in the entire watershed sodded by the first week in April. Cooperators who have not made provision for pasture work are requested to get in touch at once with the Supervisor in their section, or to write in to the Soil Erosion Service offices.

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All cooperators who desire seed for strip-cropping will be furnished Sudan, Hegari or Red-top Sorghum seed by the Soil Erosion Service to be seeded as a thick planted crop in strips. This seed is being furnished to take the place of the oats which were planted in strips or on steep land and have been killed by the freeze. Seed furnished by the Soil Erosion Service must be planted according to approved strip-cropping methods. See diagrams under "Seed Furnished for Strip-cropping" in this issue for the various plans of stripping.

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The Service appreciates the interest being shown in the farm record work. Some few books are still available and will be placed with interested farmers as early as possible. We urge that farmers cooperating with this phase of the work study the record books in order that the best use might be made of them. Regular visits are to be made to each farmer for giving assistance with the record keeping.

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PROGRESS REPORT FOR JANUARY, 1935.

1. 201.4 miles of terrace lines were run during the month of January.

2. Total miles of terrace lines run up to January 31st, 2,313.9 miles.

3. On 485 farms comprising 60,160 acres which are under cooperative agreement, terrace lines have been run on 50,775 acres.

4. 96.2 miles of terraces were constructed during the month of January.

5. Total miles of terraces constructed to January 31st, 858.5 miles.

6. During the last week in January 50 farmers began keeping farm records on record books which were issued to them by the Soil Erosion Service.

7. 174 check dams for controlling erosion in permanent waterways were built in January. 2,264 dams have been constructed prior to January 31st.

8. 109 terrace outlets were sodded during the month of January.

9. 7,457 square yards were sodded with Bermuda and Buffalo sod in 9 ditches this month.

10. 3,885 square yards were sodded in 2 pasture gullies.

11. Pasture sodding was completed on 8 farms. Area sodded, 85 3/4 acres.

12. 137 spreaders were constructed in ditches and terrace outlets in preparation for vegetation.

13. Soil erosion control practices have either been completed or are in the process of completion on 485 farms.

14. 9,075 acres were mapped, showing soil types, degree of erosion and slope of land, during the month of January.

15. Educational meetings, for adults, were held twice in January.

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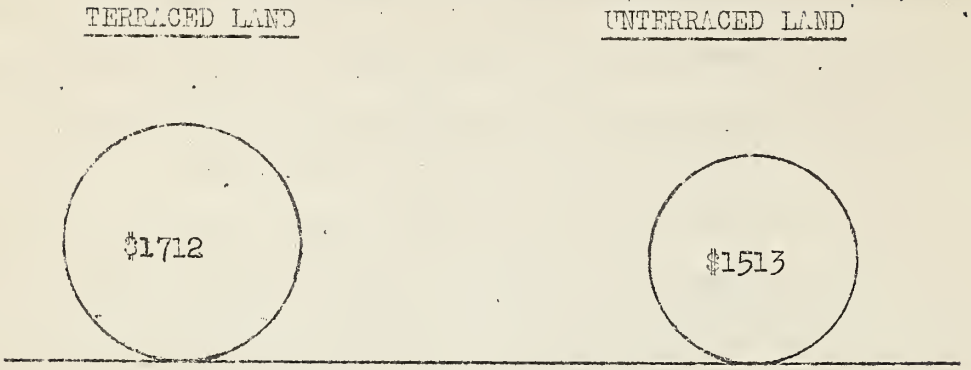
In the United States alone, the total yearly damage of soil erosion, measured in terms of money, is estimated at $400,000,000.00

GROSS INCOME PER 100 ACRES IN 1933



Records of farm production and income for the 1933 crop year were secured by means of a survey of several hundred farms throughout the Elm Creek Watershed. A number of the farms included in this study had been terraced for several years. Separate summaries of the income data have been made of the group of terraced farms and the unterraced farms falling in the size group most typical of the area (farms with total acreage ranging between 71 and 120 acres.)

The following figures are revealed by the summary material:

I. Amount of Gross Income,	Per Acre	Per 100-acre farm
On terraced farms	$17.12	$1712.00
On unterraced farms	15.13	1513.00

II. Labor Income	Per Acre	Per 100-acre farm
On terraced farms	$ 7.52	$ 752.00
On unterraced farms	4.08	408.50

Increased income of the terraced farms over the unterraced farms ---------- $ 343.50

Note: The average acreage of this group was approximately 100 acres.

The increase in returns on labor and capital investment has been obtained on this group of farms within the first five years after terraces were constructed. It is believed that a greater increase will be found to exist within a ten-year period, as the gap is widened between the productivity of soils unprotected contrasted to terraced and otherwise protected lands.

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SODDING TERRACE OUTLETS AND OUTLET DITCHES IN THE TEXAS BLACKLANDS

Vegetation should and always will play an important part in an erosion control program. Even though concrete, rock masonry, or loose rock structures are necessary to protect the terraces in many cases, control measures are not complete unless used in connection with vegetation. Grass planted around the wing walls of permanent structures and in and around loose rock checks will protect the most vulnerable spot of a terrace. Vegetation alone will, in many cases, successfully protect terrace outlets and outlet ditches without the aid of concrete or rock-masonry spillways. Where the terraces can be emptied on well sodded pastures additional protection may not be necessary.

Factors Limiting Vegetative Control of Outlets

The efficiency of vegetation in controlling erosion in terrace outlets, and outlet ditches, depends upon several factors. The type of soil, area of drainage, degree of slope, kind and condition of vegetation used, and size and shape of outlets are all important factors to be considered.

Tight clay soils are less adapted to vegetative protection than sand or sandy loam soils because of the contraction of the soil in dry weather causing huge cracks which allow the concentration of water and a resultant cutting out of the channel. The area that can be drained into a vegetative outlet ditch with safety is not known. Observation in the blacklands of Central Texas leads us to believe that 15 to 18 acres can be taken care of in many instances. The acreage controlled by vegetation on soil types of a more porous and absorptive nature could probably be increased. The degree of slope over which the water must flow is an important factor to consider in designing the proper protection of a terrace outlet. Our observations lead us to believe that vegetation alone will not successfully protect a terrace outlet where the slope of the drop to the outlet ditch is greater than 4 to 1 if as much as 3 acres are drained into the outlet. We believe outlet ditches under favorable conditions may be protected with vegetation when the area drained is not more than 18 acres and the slope not over 3%. Vegetation should completely cover the channel and sides of the outlet to keep the water from cutting.

Design and Construction of the Outlet Ditch

The channel of the ditch must be so designed that it will have a shallow uniform depth. The bottom of the ditch must be broad and level. The sides of the ditch should have not more than a one and one-half to one slope.

The size of vegetative outlets will vary with the conditions encountered, such as average rainfall, type of soil, and slope. We believe a safe rule to follow in figuring the size of single terrace outlets emptying into well sodded areas is to allow two feet of width for every acre drained. This size outlet will allow a maximum of 9 inches depth of water through the outlet.

The outlet ditch should be designed to carry a maximum depth of 8" of water figured on the basis of maximum rate of runoff occurring once in a 10-year period. In climates and soils similar to those of the Elm Creek Watershed the following general rules may be used. For a 2%--5% slope and areas less than 8 acres, add 3 to the number of acres drained and the result will be the width of the ditch in feet. For areas greater than 8 acres add 5 to the number of acres drained in order to obtain the width of the ditch in feet. For slopes 5% or more and areas less than 5 acres use a ditch width of 4 feet. For slopes 5% or more and areas between 5 and 12 acres subtract one from the total number of acres and the resultant figure will be the ditch width in feet. For slopes 5% or more and areas greater than 12 substract 2 from the total number of acres drained to get the ditch width in feet.

The above rules are based on computations for slopes of 2% and 5% and if used as suggested will be safe providing a satisfactory vegetative cover is established. These recommendations should not be changed except by someone experienced in hydraulic designing. It would be better if the ditch is prepared and sodded a year before terraces are emptied into it in order that the grass may be established before the water passes over it. A good plan would be to run the terrace lines and in place of building the terraces the first year, strip-crop the field with a broadcast crop where the terraces will be built. After the broadcast crop is harvested the terraces may be constructed, which, under normal conditions, would allow time enough for the grass to become established in the ditch.

Owing to the great amount of work to be done by the Soil Erosion Service in a short period of time it has been necessary to do all types of work at the same time. Terraces are in many cases being built before outlets are sodded. This has made it necessary to protect these ditches with spreaders until the grass is established. It is believed, however, that it is going to be necessary to maintain some type of spreader in vegetated outlets in the Houston clay soils of Texas because of the contraction of the soil in the summer, causing cracks even in well sodded areas.

Spreaders

Spreaders are simple devices to help prevent cutting of the channel, and to spread the water evenly over the ditch bottom. They may be constructed with logs, lumber, corrugated galvanized iron, loose rock, or concrete. The weir or top of the spreader should be level across the outlet and flush or even with the bottom of the ditch, with wing walls extending up the side high enough to take care of a maximum flow of water. The spacing of the spreaders will depend upon the slope. We are placing two spreaders between terraces, in the outlet ditch when the slope ranges from 2 to 4%.

It is sometimes advisable to empty terraces into an old ditch or natural waterway which may be rather deep. If it is not practical to build concrete spillways or dams in the ditch, then the terrace outlet is cut down to a maximum 4 to 1 slope, with proper width to carry a maximum of 8 inches of water. Spreaders are then constructed in the terrace outlet, the number depending upon the length and degree of slope of the outlet channel.

The scarcity of timber and rock in the Elm Creek Watershed has made it necessary for the Soil Erosion Service to use other material for the construction of spreaders. Both creosoted 2" boards and concrete are beind used. It has been found, however, that concrete is the cheaper and of course is more permanent.

Concrete Spreaders

Concrete can be used in two ways: A wet mix poured in a narrow trench or a dry mix put in sacks and laid in a trench. A 1:2:4 mix should be used, although where sand or gravel is found locally other mixtures will be satisfactory. For the wet mix a trench 6 inches wide and 10-12 inches deep is prepared and the concrete poured in. It is advisable to use a 3/8" bar of reinforcing steel within the top four inches. Two strands of #10 wire may also be used for reinforcing. For the dry mix in sacks, a trench the width of the sacks used and about 10 inches deep is prepared. The concrete is then mixed dry and put in sacks, filling the sacks about three-fourths full. They are then laid in the trench two layers deep, the top layer breaking the joints of the bottom layer. Staples made of 3/8" reinforcing steel are driven through the sacks, tying them together. A maul or sledge can then be used to tamp the top layer and level it. If for any reason it is necessary to get these spreaders to set in a day or two, wet the sacks good, otherwise the first rain will do the job.

Sodding

The ditch or terrace outlet is sodded just as soon as possible after the spreaders are completed. The best grasses for erosion control are perennials which form a heavy mat above the ground and have an extensive root system. Grasses with above ground runners, or prostrate stems, which root at the node, such as Bermuda or Buffalo grass, or grasses which produce rhizomes or underground stems from which new plants are formed each year, such as Dallis grass, are the best soil binding plants. Ditches may be seeded or sodded. Bermuda should be sodded instead of seeded because the germination percentage of the seed is low. Buffalo grass seed are hard to obtain, and if the native sod is available sodding is recommended. Italian Rye grass, or a winter grain, may be seeded in the winter to protect the ditch until Bermuda or Buffalo becomes established in the spring or summer. Bermuda or Buffalo is sodded in strips across the channel. Trenches are dug 5 inches deep by 6 inches wide, manure spread in the bottom, and an inch layer of top soil placed on the manure to prevent burning. The trenches are spaced approximately 8 inches apart. Close spacing of the trenches is necessary to get complete coverage of the ditch in a short time. The sod is plowed up with a long moldboard plow, loaded in trucks, and hauled to the ditch. Special sod cutters have been tried, but owing to the fact that the blackland sod breaks up and requires more labor and careful handling to carry it in strips, it has been found more economical to plow up the sod. After the sod is placed in the trench, more manure is placed between the sod and the side of the trench. A thin layer of field soil is then spread over the sod and tamped well. The entire ditch is then seeded to rye grass. This is done by cutting the soil with a rake, then broadcasting the seed and covering with the back of the rake. We are striving to make a complete vegetative cover in the shortest

possible time. If the farmer objects to Bermuda, Buffalo grass is used. Paspalum distichum and wire grass (Panicum obtusum) are being used to some extent. Dallis grass is being tried in the Elm Creek Watershed also, but its lack of adaptability to hot dry summers will probably limit its use.

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RESOLUTION PROPOSED AND ADOPTED BY THE TEXAS AGRICULTURAL WRITERS ASSOCIATION IN ANNUAL MEETING SAN ANTONIO, TEXAS. JAN. 12, 1935.

Resolution by Resolutions Committee, calling attention to and commending Soil Erosion Control Agencies in the State of Texas. Motion to adopt by Eugene Butler, seconded by E.R. Eudaly. Carried:

WHEREAS the depletion of soil fertility and destruction of farm lands by erosion has created a situation which endangers community, state, and national welfare; and

WHEREAS, due to conditions of soil type, topography, rainfall and general disregard of fundamental principles of soil conservation, the farm and ranch lands of Texas have already suffered irreparable damage; and

WHEREAS, in addition to the splendid work which has been and is being done by the Extension Service of the A.&M. College, Department of Vocational Agriculture, Federal Land Bank, and other agencies, we now have in the state three areas upon which the Soil Erosion Service has established demonstrations of erosion control through the coordinated use of all the known methods of reducing soil and water wastage,

THEREFORE, BE IT RESOLVED that we express our appreciation and commendation of the progress that is being made toward the solution of this important problem, and pledge ourselves to support and encourage it in every possible way.

RESOLUTIONS COMMITTEE

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THE SOIL WE TILL MUST FEED, NOT ONLY THIS GENERATION, BUT ALL SUCCEEDING GENERATIONS.

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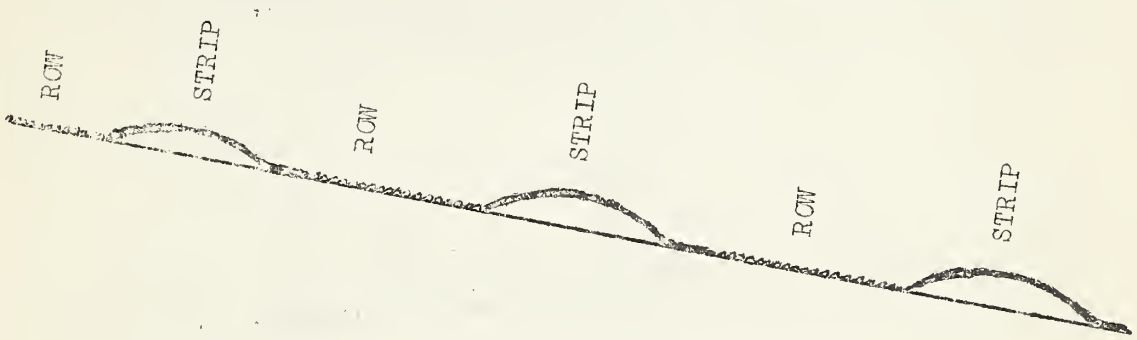
SEED FURNISHED FOR STRIP-CROPPING

Due to the freeze killing the winter grain, the Soil Erosion Service will replace the oats which were planted in strips or on steep land to prevent erosion with Red Top Sorghum, Hegari or Sudan.

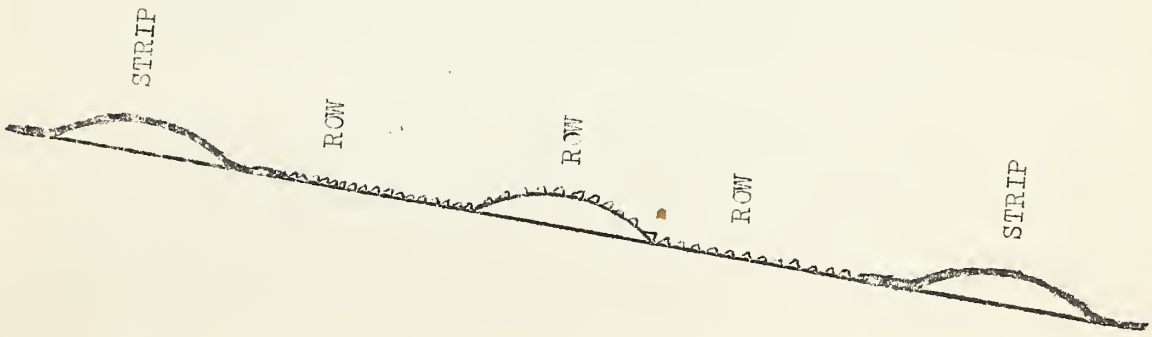
The seed must be planted in strips according to recommendations of the Soil Erosion Service.

The cooperator may use any one of the following plans:



1. This plan will allow 30 to 40% of the field in close planted crops.

   In Plan No. 1. every terrace is planted to a close planted crop extending below the terrace enough to include the point rows.



2. This plan will allow 30 to 40% of the field in close planted crops.

   In Plan No. 2. every other terrace is planted in a close planted crop extending above and below the terrace far enough to include point rows. This plan permits strips to be alternated each year.

3. This plan will allow 25% of the field in close planted crops.

In Plan No. 3. every terrace is stripped in a close planted crop. You have less feed and more row crops including point rows. This plan works well where rows are already laid off.

4. This plan will allow 25 to 30% of the field in close planted crops.

Plan No. 4. works well where you have your rows laid off and want to do away with point rows. Pull down your point rows and enough long rows to make the strip a minimum of twenty to twenty-five feet wide, and seed to a close planted crop. This works well where the slope is fairly uniform.

The Soil Erosion Service recommends that 30% of the total cultivated area be sowed to a close planted crop. 30% sowed in strips according to one of the 4 recommended systems will reduce erosion to a minimum and should furnish enough feed for all livestock on the average farm. Corn, of course, should be grown in addition to the hay crops.

The Cooperator must use one of the systems recommended by the Soil Erosion Service. The field, or portion of the field, that is stripped must be a complete demonstration, with the seed planted according to the recommendations of the Soil Erosion Service and not scattered over a large area in strips that are too narrow or spaced too widely apart to control erosion. The Cooperator will be allowed to plant enough seed in rows to harvest seed for planting next year.

Farmers who want seed and have not yet made application for it must contact the Soil Erosion Service offices by Saturday, February 23rd if they expect to get seed.

RAINFALL DURING JANUARY, 1935 IN ELM CREEK AREA

BIG ELM AREA

Station No.	at or near	rainfall in inches	observer
11	Stringtown	.86	C.M. Dyess
12	Heidenheimer	none	W.W. Lowry
13	Oscar	1.20	Frank Mares
14	Doubleheader	1.29	Leo Sana
15	N.E. Temple	none	Mrs. O. Stracener
16	Troy	none	Wm. Brown
17	Pendleton	none	W.M. Phillips
18	Moody	none	R.I. Melton
19	Shiloh Church	1.19	V.A. Spohn
20	Bottoms Store	1.22	R.H. Bigham
21	Oenaville	1.22	H.P. Linn
22	Theo Church	.78	Thos. Earnhardt
23	Bean Hill	1.27	Thos. B.R. Gwin
24	Seaton	1.33	F.J. Macek
25	Airville	1.29	Jerry Beran
26	Cyclone	1.35	Robert Hoelscher
27	S.W. Meeks	.25	F.J. Bedrick

NORTH ELM AREA

40	Yarrellton	1.46	I.M. Wilkerson
43	Barclay	1.35	Robt. Stroh
44	Terry Chapel	1.23	A.E. Pagel
45	Burlington	1.50	W.E. McAtee
46	S.E. Meeks	1.15	F.A. Cochran
47	Westphalia	1.28	Geo. Ranly

UNITED STATES
DEPARTMENT OF THE INTERIOR
SOIL EROSION SERVICE
OFFICE OF THE REGIONAL DIRECTOR
TEMPLE, TEXAS.

OFFICIAL BUSINESS

SOIL EROSION SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR
ELM CREEK WATERSHED--CENTRAL TEXAS
NEWS LETTER----------NO. 9

TEMPLE, TEXAS. FEBRUARY, 1935.